independent economics

Labour cost escalators for NSW, the ACT and Tasmania

This report was prepared for Ausgrid

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Independent Economics is an independent provider of economic modelling services to support economic policy analysis and forecasting. We are strongly committed to independent modelling that provides robust analysis and real solutions to meet client needs. In Australia, we provide services to government and industry, and we also provide services internationally.

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Executive summary

This report presents forecasts for nominal wages growth in the utilities industry and the professional services industry in the economies of Australia, New South Wales (NSW), Tasmania and the Australian Capital Territory (ACT). It also presents forecasts for wages growth in the overall workforce in these economies.

In accordance with its responsibilities under the National Electricity Rules (NER) the Australian Energy Regulator (AER) is required to make determinations on the prices that Ausgrid and other owners of electricity distribution assets can charge their customers for the use of these assets. For this determination the NER states the AER must satisfy itself that the company's forecast for operating expenditure includes costs that are efficient. In doing this, the AER is required to consider total labour costs (i.e. forecast employees multiplied by forecast nominal wages).

In practice, the AER determines whether the utilities industry's labour cost projections are efficient by considering the outlook for nominal wages per worker, after an adjustment is made for inflation and output per worker. If nominal wages in the utilities industry are increasing at a rate that is faster than inflation and productivity combined, this means that real costs per worker are increasing. This cost increase should be passed onto the customers of the utilities industry.

Which nominal wage measure should be used?

The AER currently prefer to use WPI to measure nominal wages. This report analyses the advantages and shortcomings of WPI wages and compares the WPI to other wage measures such as the AWE.

Each nominal wage measure has its own strengths and weaknesses. For example, the WPI is the least volatile but does not include any composition effects. In fact, no wage measure accurately captures composition effects because an ideal wage measure would use weights that reflect the substitutability of different types of labour used by the utilities business. The WPI, a fixed weighted index, would be a good proxy for wages when different types of labour have low substitutability. Conversely, the AWE, a variable weighted index, would be a good proxy for wages when there is a high level of substitutability.

Ideally, the AER should choose the wage measure – AWE or WPI – that is most consistent with the methodology utilities businesses use to plan their labour requirements. This is because forecasts of wage growth should be combined with forecasts of growth in labour demand to develop forecasts of growth in the wage bill or total labour costs. If labour requirement planning is done on a per-hour basis, then WPI would be appropriate because it measures wage growth on a per-hour basis. Conversely, if labour requirement planning was done on a per worker basis, then the AWE would be more appropriate, since this is also measured on a per worker basis.

However, Ausgrid have informed Independent Economics that neither approach is feasible, and that utilities companies simply grow their labour costs at a rate consistent with the outlook for the labour cost escalator. This means we need to consider forecasts of both WPI and AWE, in order to form a judgement on labour cost pressures in the utilities industry. Forecasts of both measures are presented in this report.

Forecasting the AWE and WPI

Nominal wage growth is forecast using Independent's Macro-econometric model and a new labour cost model developed for this project. The approach used by Independent Economics ensures all forecasts are grounded in sound economic theory. For example, tight labour market conditions in a particular state or industry would lead to an increase in wages for that particular state or industry.

In addition, the modelling approach utilised leads to forecast of nominal wages across states and industries which are consistent with the national outlook. This is because wage growth in each state or industry is forecast relative to economy-wide wages. For example, Industry-level wages are forecast to grow *relative* to economy-wide wages; this is determined by the outlook for labour demand in each industry *relative* to economy-wide labour demand. Labour demand in each industry is driven by activity in the industry. This means, for example, that the depreciation of the Australian dollar would encourage activity in the manufacturing sector as they become more internationally competitive. This would support solid wage growth in manufacturing.

The economic outlook

Table A. Growth in nominal wages in the Australian economy (per cent)

	WPI wages				AWE wages			
	Australia	NSW	Tasmania	ACT	Australia	NSW	Tasmania	ACT
2008-09	4.1	3.9	4.4	4.0	3.8	1.0	0.6	6.5
2009-10	3.0	3.0	3.7	3.3	5.3	4.0	7.1	6.8
2010-11	3.8	3.8	3.4	3.6	4.0	3.3	6.5	7.1
2011-12	3.6	3.6	3.5	3.3	4.0	2.9	5.2	5.7
2012-13	3.1	3.0	2.9	3.8	3.7	3.9	4.4	5.1
[redacted]								

[redacted]

Table B. Growth in nominal wages in the Utilities industry (per cent)

	Utilities Industry - WPI wages				Utilities Industry - AWE wages			
	Australia	NSW	Tasmania	ACT	Australia	NSW	Tasmania	ACT
2009-10	4.3	3.8	4.9	4.3	8.9	7.5	10.7	10.1
2010-11	4.1	3.5	3.8	4.0	10.7	9.5	12.8	13.3
2011-12	3.5	3.2	3.5	3.4	2.6	1.9	4.2	4.8
2012-13 (e)	4.0	3.7	3.9	4.7	4.9	5.2	5.8	6.7
[redacted]								

[redacted]

Table C. Growth in nominal wages in the Professional Services industry (per cent)

	Professional Services - WPI wages				Professional Services - AWE wages			
	Australia	NSW	Tasmania	ACT	Australia	NSW	Tasmania	ACT
2009-10	2.9	4.3	3.5	3.3	5.8	4.6	7.7	7.1
2010-11	4.4	3.6	4.0	3.6	5.1	4.0	7.1	7.6
2011-12	4.4	3.7	4.4	3.3	2.5	1.9	4.2	4.8
2012-13 (e)	3.5	3.5	3.4	3.8	2.3	2.6	3.2	4.0

[redacted]

Wage growth in the utilities industry versus the electricity distribution industry

Under the ABS industry classification, ANZSIC 2006, the utilities industry is made up of the Electricity, Gas, Water and Waste sub-industries. The Electricity industry itself is made up of several components, including generation, transmission, distribution, retail and electricity market operations. Ausgrid is an electricity distribution business.

Historically, the AER has applied the AWE or WPI for the utilities industry for all its determinations, regardless of whether the business is primarily providing one particular component of the electricity supply chain e.g. distribution. The analysis presented in Section 6 of this report suggest the WPI and AWE wages data for the utilities industry provide a reasonable proxy for wages in the electricity distribution and electricity transmission sub-industries. While these industries employ a different mix of workers, analysis which combines employment by occupation and wages growth by occupation suggests that WPI wages growth is similar in these industries. This, combined with employment data that suggests patterns in hours per worker are likely to be similar in both, also suggests AWE wage growth is similar in both.

Trends in labour productivity in the utilities industry

Labour productivity, measured in output per worker has been falling in the utilities industry since 2001. Output has grown at its normal pace, while employment has grown strongly. Topp and Kulys (2012) attribute this to two factors. Firstly, the industry has had a high demand for workers to support its recent investment boom. Secondly, it has also been hiring people to learn the skill of older workers who are about to retire.

[redacted]

[redacted]

[redacted]

1 Introduction

In accordance with its responsibilities under the National Electricity Rules (NER) the Australian Energy Regulator (AER) is required to make determinations on the prices that Ausgrid and other owners of electricity distribution assets can charge their customers for the use of these assets. For this determination the NER states the AER must satisfy itself that the company's forecast for operating expenditure includes costs that are efficient. In doing this, the AER is required to consider total labour costs.

In practice, the AER determines whether the utilities industry's labour cost projections are efficient by considering the outlook for nominal wages per worker, after an adjustment is made for inflation and output per worker. If nominal wages in the utilities industry are increasing at a rate that is faster than inflation and productivity combined this means that real costs per worker are increasing. This cost increase should be passed onto the customers of the utilities industry.

Given this, this report presents forecasts for nominal wages growth in the utilities industry and the professional services industry in the economies of Australia, New South Wales (NSW), Tasmania and the Australian Capital Territory (ACT). It also presents forecasts for wages growth in the overall workforce in these economies.

This report is structured as follows.

- **Section 2** explains what an ideal nominal wage measure should reflect. As there are various wage measures available from the ABS, section 2 also explains which data series is the most appropriate.
- **Section 3** explains the methodology we have used to generate our wages forecasts in the relevant industries, in the relevant states.
- **Section 4** examines the current economic environment and provides forecasts of the economy, the labour market and wages growth.
- **Section 5** provides detailed financial year forecasts for nominal wage growth in the relevant industries at the state level.
- **Section 6** evaluates the appropriateness of using WPI wages and AWE wages for the utilities industry as a measure for wages growth in the electricity distribution industry.
- **Section 7** evaluates the productivity performance of the utilities industry.
- **Appendix A** provides detailed calendar year forecasts for wages growth in the relevant industries in the relevant states.
- **Appendix B** provides a history of growth in output per worker in the utilities industry

While all care, skill and consideration has been used in the preparation of this report, the findings refer to the terms of reference of Ausgrid and are designed to be used only for the specific purpose set out below. If you believe that your terms of reference are different from those set out below, or you wish to use this report or information contained within it for another purpose, please contact us.

The specific purpose of this report is Labour Cost Escalators in the New South Wales, Tasmania and the ACT.

The findings in this report are subject to unavoidable statistical variation. While all care has been taken to ensure that the statistical variation is kept to a minimum, care should be taken whenever using this information. This report only takes into account information available to Independent Economics up to the date of this report and so its findings may be affected by new information. The information in this report does not represent advice, whether express or inferred, as to the performance of any investment. Should you require clarification of any material, please contact us.

2 Wage measures

According to the National Electricity Rules (NER), the AER must satisfy itself that a utilities company's forecast for operating expenditure includes costs that are efficient. In doing this, the rules state that the AER is required to consider total labour costs.

In practice, as explained in section 1, the AER considers the outlook for growth in nominal wages per worker, after an adjustment is made for inflation and output per worker. If nominal wages in the utilities industry are increasing at a rate that is faster than inflation and productivity combined this means that real costs per worker are increasing. This cost increase should be passed onto the customers of the utilities industry.

The ABS publishes a number of wage measures. For a given change in wages in the economy, the nominal wages growth that each measure registers will differ as each is calculated differently, and covers a different scope. Section 2 introduces these different wage series. It explains which wage series is the most appropriate, given the requirements of the AER. It explains which wages series, when it is adjusted for productivity and inflation growth, yields the most appropriate measure of growth in unit labour costs. In broad terms, this evaluation uses the criteria of:

- which measure exhibits the lowest (or an acceptable level) of volatility;
- which measure best picks up the effect of productivity on wages;
- which measure picks up specific labour costs that should be included in the AER's labour cost escalator; and
- whether the wage measure that is used should have fixed or variable weights.

The measure of nominal wages used by the AER is referred to in determinations as the 'labour cost escalator' .Currently, the AER's preferred labour cost escalator is a measure of wages called the Wage Price Index (WPI). In past determinations it has used average weekly earnings (AWE) as the labour cost escalator. The strengths and weaknesses of both measures, as well as other wage measures released by the ABS are discussed in this section.

2.1 Background

There are a number of nominal wage measures published by the ABS that are widely used. This includes the Wage Price Index (WPI), the Compensation of Employees (COE) and the Average Weekly Earnings (AWE). An overview of each measure is discussed below.

2.1.1 Wage Price Index

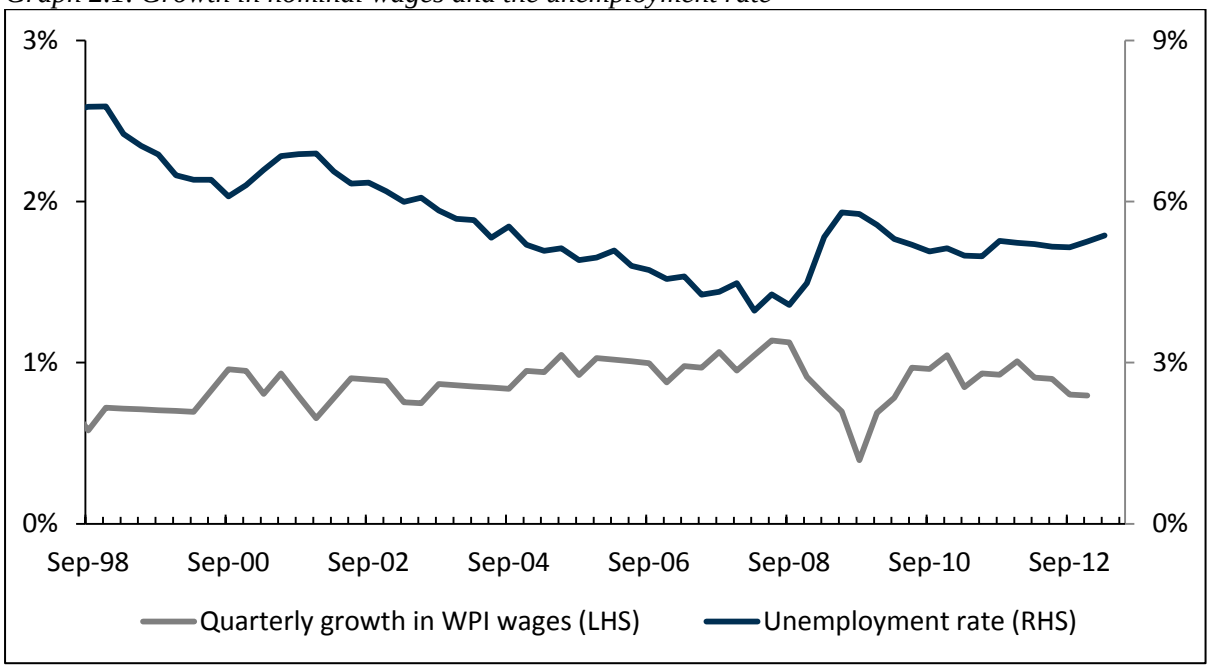
The WPI measures the weighted average change in the *labour cost per hour* of the jobs that are performed in an industry. The weights in this calculation are the labour hours required to perform each job.

The weights used in the WPI are held constant when calculating the time series. That is, the mix of labour hours in a particular year, called the base year, is used as weights for the entire time series. The current base year for the series is 2008-09. As the weights of the WPI are held constant, the index measures the average magnitude of wage increases faced by an industry, assuming that employers in the industry do not respond to changes in the relative wage by changing the mix of workers they employ. That, is the wage increases are calculated based on the mix of workers prevailing in 2008-09.

From time to time, the ABS updates the weights used in calculating the WPI by changing the base year used to calculate the weights in a process known as rebasing. Rebasing does not occur frequently, the WPI series was last rebased in November 2009 when the base year was changed from 2003-04 to 2008-09. This rebasing is applied to the entire historical time series so that a consistent series is presented under the new base year.

The WPI is driven by the state of the labour market. When the unemployment rate is low or falling, employers find it more difficult to replace members of their workforce or expand it, and this usually results in the growth of hourly pay rates increasing. When the unemployment rate is high or rising, employers find it easier to replace members of their staff or expand it, which means hour pay rates tend to grow at a slower pace. This relationship is shown in Graph 2.1.

Graph 2.1. Growth in nominal wages and the unemployment rate



Source: ABS; Independent Economics

2.1.2 Average Weekly Earnings

The AWE data are the sum of regular cash payments made to employees,[1] divided by the number of employees. As the AWE data are the sum of payments to employees, they pick up the effect of changes in the employee mix. This means the AWE data provides a nominal wage measure that uses variable weights, which means it calculates wage growth after employers in the industry have responded to changes in relative wages or other changes in the labour market by changing the mix of their employees.

2.1.3 Compensation of Employees

COE data is published in the national accounts and is the comprehensive measure of income earned by employees. Where the AWE data are simply the sum of regular cash payments to employees, the COE data is the sum of regular and irregular payments to employees, plus employer social

[1] Regular cash payments made to employees include: ordinary time and overtime payments, payments by result, taxable allowances, commissions, gratuities, tips, income tax, regular bonuses, regular payments under profit sharing schemes and all salary scarified.

contributions (which include superannuation payments). Irregular payments include 'irregular bonuses' and 'irregular payments from profit sharing schemes' that are paid to employees.

One way to compare these nominal wage measures is to consider the additional information contained in AWE wages and COE wages *relative* to WPI wages. The WPI are changes in the hourly pay rate that flows from the state of the labour market, assuming that employers make no adjustments to the composition of their workforce. Growth in AWE and COE wages incorporate changes in hourly pay rates, but also allow employers to adjust the composition of their workforce. This means that, unlike the WPI, movements in the AWE and COE reflect the impact of compositional changes in the workforce. This includes, for example, changes in the education level and age of the workforce. Finally, AWE and COE wages per worker change as hours per worker change. Changes in hours per worker are an important way the state of the labour market can influence wage costs which the WPI does not reflect.

The remaining sub-sections discuss the advantages and shortcomings of the current labour cost escalator used by the AER, the WPI, under each criteria listed earlier in this section. The analysis also compares the strengths and weaknesses of the WPI against the other wage measures. This analysis is summarised in Table 2.1 the table below.

Table 2.1 Summary of the strengths and weaknesses of each nominal wages measure

	Wage price index	Average weekly earnings	Compensation of employees
Definition / description	Laspeyres index which measures average per cent change in the hourly labour costs across the jobs that are performed to produce output in an industry, weighted by labour hours required to perform each job	Sum of regular wages and salaries in cash paid to employees, divided by number of employees	Irregular and regular wages and salaries paid in cash and in kind, plus social contributions of employers (which include superannuation payments)
Comment	Measures wages growth from increases in pay rates; does not measure wages growth due to changes in the composition of the workforce	Measures wages growth due to increases in pay rates and due to changes in the composition of the workforce	The only wage measure that is fully consistent with the National Accounts
Used by other forecasters?	The AER currently use the WPI to measure wages growth. The Treasury's outlook for the Australian labour market is based on forecasts of the WPI.	Has been used by the AER in past determinations.	Used by economic modellers, including Independent Economics.
Volatility	Low	Medium	High
Consistency with productivity measures	Poor	Medium	High
Measurement of specific labour costs that should be included in labour cost escalator	Acceptable (misses superannuation, but an adjustment can be made for this if necessary)	Acceptable (misses superannuation, but an adjustment can be made for this if necessary)	High
Fixed or weighted index	Fixed	Variable - measures growth in wages that flow from changes in the structure of the workforce	Variable - comprehensively measures growth in wages that flow from changes in the structure of the workforce

Source: ABS; Independent Economics

2.2 Advantages of the WPI

The WPI has three key advantages. Firstly, it is the nominal wage measure that exhibits the lowest level of volatility. This makes forecasts of the WPI more reliable, as they are subject to less statistical error. In terms of forecast reliability, the lower volatility of the WPI is partially offset by its short history. In contrast, the AWE and COE are more volatile.

Secondly, the WPI is the preferred measure of many economists who are interested in an index that gives them a simple indicator of the state of the labour market. For example, the Australian Treasury use forecasts of the WPI to communicate their view on the outlook for the labour market.[2] The WPI is also used as background information by Fair Work Australia when determining award wages and the Reserve Bank of Australia when developing monetary policy.[3]

The AWE and COE are also used in labour market analysis, though not as widely as the WPI. The AWE is useful because it provides information not only on nominal wage growth but also on nominal wage levels. The COE is the only wage measure that is fully consistent with the National Accounts and thus is often used in economic modelling.

Thirdly, the WPI measures the pure 'price effect' of wage increases for a particular state or industry. This is because, as discussed above, the quantity and quality of labour inputs used to weight the index are held constant. This means the index abstracts from how changes to workforce composition or hours worked affects wage growth in a state or industry. Therefore, the index is useful when the focus of the analysis or application is solely on price increases. For example, because it distinguishes the occupational mix of an industry at a point in time, and since wage growth across occupations can vary, the WPI will show fast wage growth in industries where wages for key industry occupations are growing rapidly.

2.3 Shortcomings of the WPI

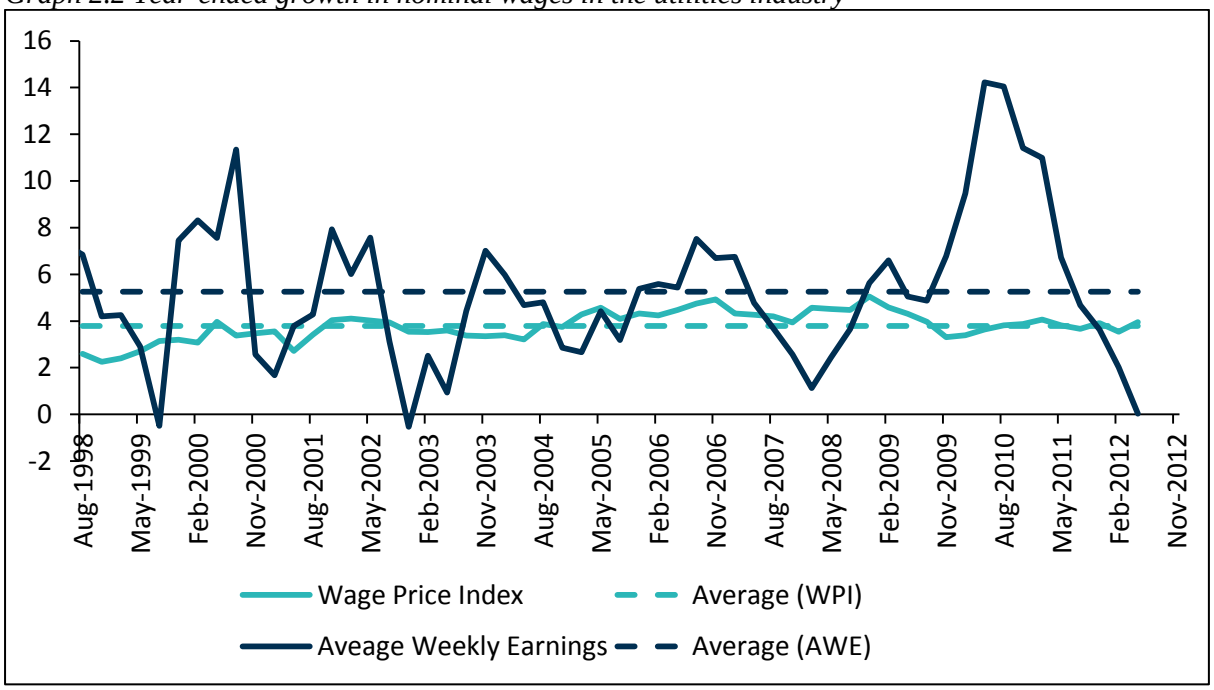
As discussed above, the WPI is well suited for applications where the sole focus is on price increases. However, as noted earlier, the AER is responsible for considering growth in *total labour costs* in the utilities industry. This section shows that the WPI does not measure growth in total labour costs per employee for three reasons. This is because there are various drivers of nominal wage growth that the WPI does not respond to, this includes:

- changes in the hours worked by employees;
- changes in the composition of the labour force; and
- changes in the Superannuation Guarantee (employer superannuation contribution rates).

In contrast, AWE wages pick up the growth in wages that flows from the first two of these effects, while the COE would reflect changes in superannuation rates. This analysis is important because average wages growth in the utilities industry has been much stronger when measured with the AWE. That is, the WPI has persistently grown at a weaker rate than the AWE measure (as shown in Graph 2.2).

[2] *Budget Paper 1, Statement 2 (pg. 13)* Australian Treasury (May 2013)
[3] ABS Cat. 6351.0.55.001 - Wage Price Index: Concepts, Sources and Methods, 2012

Graph 2.2 Year-ended growth in nominal wages in the utilities industry

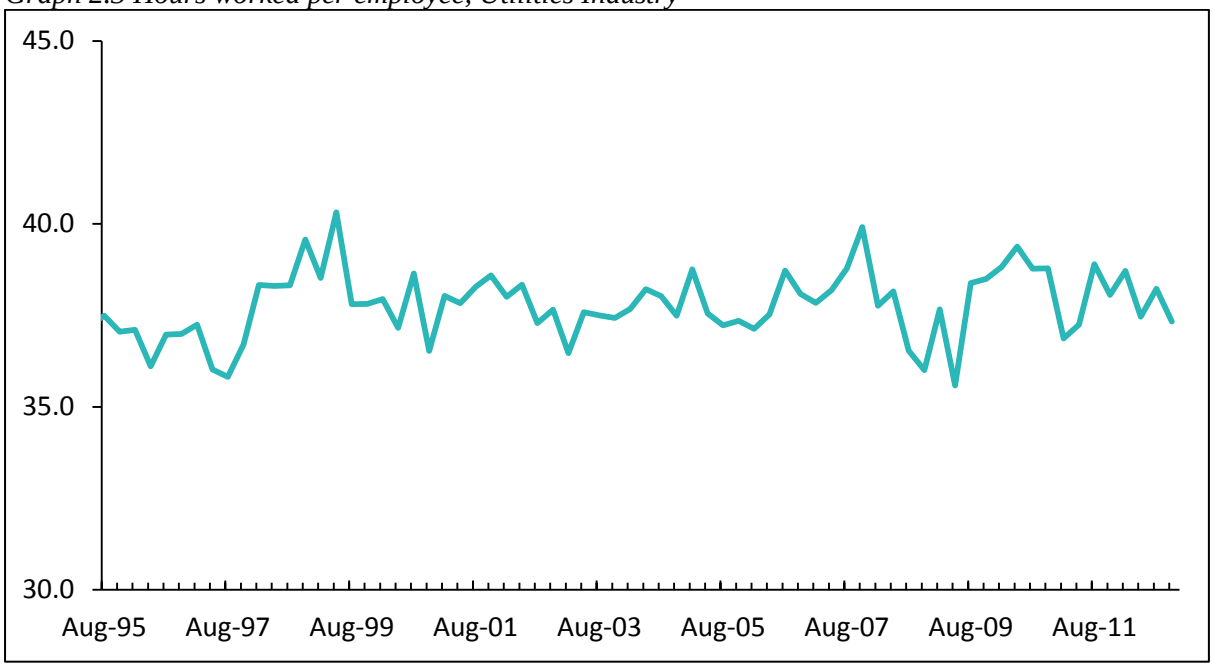


Source: ABS; Independent Economics

2.3.1 Changes in hours worked per employee

In the utilities industry, from the beginning of 2009, Graph 2.2 shows that growth in AWE wages was much quicker than growth in WPI wages. A key driver of this was a sharp increase in hours worked per employee. As the WPI measures average growth in *hourly* pay rates, it does not measure the growth in wages that flows from changes in hours worked per employee. As AWE wages are the sum regular payments to employees for a week of work, they do measure the growth in wages that flows from this change. Graph 2.3 shows that hours per employee picked up in the utilities industry from 2009. The AER has not adequately discussed the wedge between growth in WPI wages and growth in AWE wages that is created by changes in hours worked per employee in its previous determinations.

Graph 2.3 Hours worked per employee, Utilities Industry



Source: ABS

As hours worked in the utilities industry increased from 2009, growth in AWE wages increased relative to growth in WPI wages for two reasons. Firstly, as employees work more hours in a week they produce more and, in the long term, are paid more. Secondly, as hours picked up, the amount of *overtime* hours picked up relatively quickly. Table 2.1 shows that overtime hours worked – as a share of total hours worked in the electricity supply industry – grew from 6 per cent to 8 per cent between 2008 and 2012. Because pay rates are higher for overtime hours, this switch in behaviour pushes up the *level* of weekly pay between periods. This change in the level between periods supports the growth rate between periods.

Table 2.1 also shows that overtime pay rates grew by more normal time pay rates between 2006 and 2012. Both the WPI and AWE pick up this change.

Table 2.1. Average hours and rates of pay in the electricity supply industry

	Ordinary time, average:		Over time, average:		Overtime hours worked:
	Hours worked	Rate of pay	Hours worked	Rate of pay	per cent of total hours
May-12	37	48	3.2	80	8.0%
May-10	37	43	2.8	69	7.1%
Aug-08*	37	38	2.4	65	6.1%
May-06	37	35	2.7	55	6.9%

Source: ABS
* 2008 data were collected in August and not May

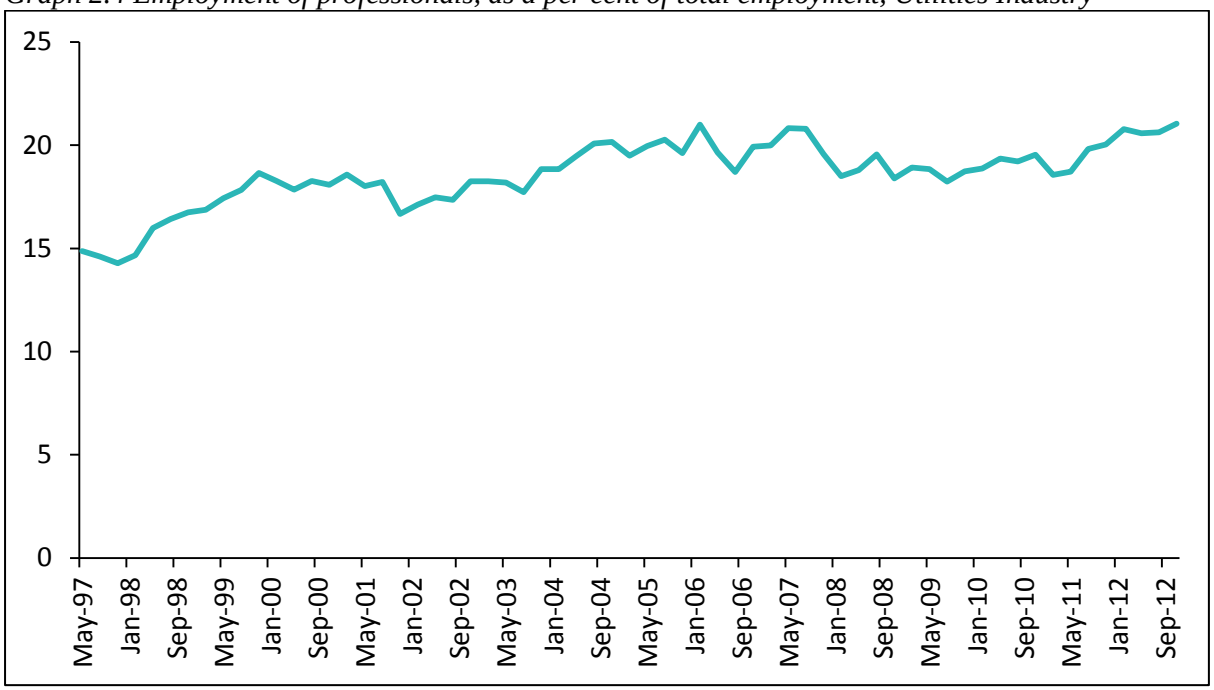
2.3.2 Changes in the composition of the workforce

As noted, Graph 2.2 shows that average growth in AWE wages has been stronger than average growth in WPI wages. This is because the structure of the utilities workforce is changing: it is switching into

occupations that are highly paid (and away from those that are lowly paid) and has become older. The WPI, with its fixed weights, does not measure the effect of these compositional changes but the AWE and COE data does.

Since the late 1990s, employment amongst professionals in the utilities industry has increased relative to employment amongst individuals with other occupations, as shown in Graph 2.4. Employment amongst professionals in the utilities industry, as a per cent of the total employment, grew from around 15 per cent in 1997 to 20 per cent in 2006 before it eased slightly. Between 2008 and 2012 this figure increased again from around 19 per cent to around 21 per cent.

*Graph 2.4 Employment of professionals, as a per cent of total employment, Utilities Industry**



Source: ABS
*4 quarter moving average

Relatively fast employment growth amongst professionals drives quicker growth in AWE wages than in WPI wages, as these individuals are relatively well paid compared to other occupations, as shown in Table 2.2. Professionals are relatively well paid because they should be more productive. One reason for this is that they are usually better educated. Combined, Graph 2.2 and Table 2.2 suggest changes in the composition of the workforce contributed to faster growth in AWE relative to WPI, especially in the late 1990s and late 2000s. That is, since wages paid to professionals are *high* relative to wages paid to other occupations, and the utilities industry has increased its employment of professionals relative to its employment of individuals that hold other occupations, this will affect the level of the average wage it pays to its employees. This would have an impact on the growth rate in wages from period to period. The AWE and COE measure capture this effect. The WPI data do not measure this effect.

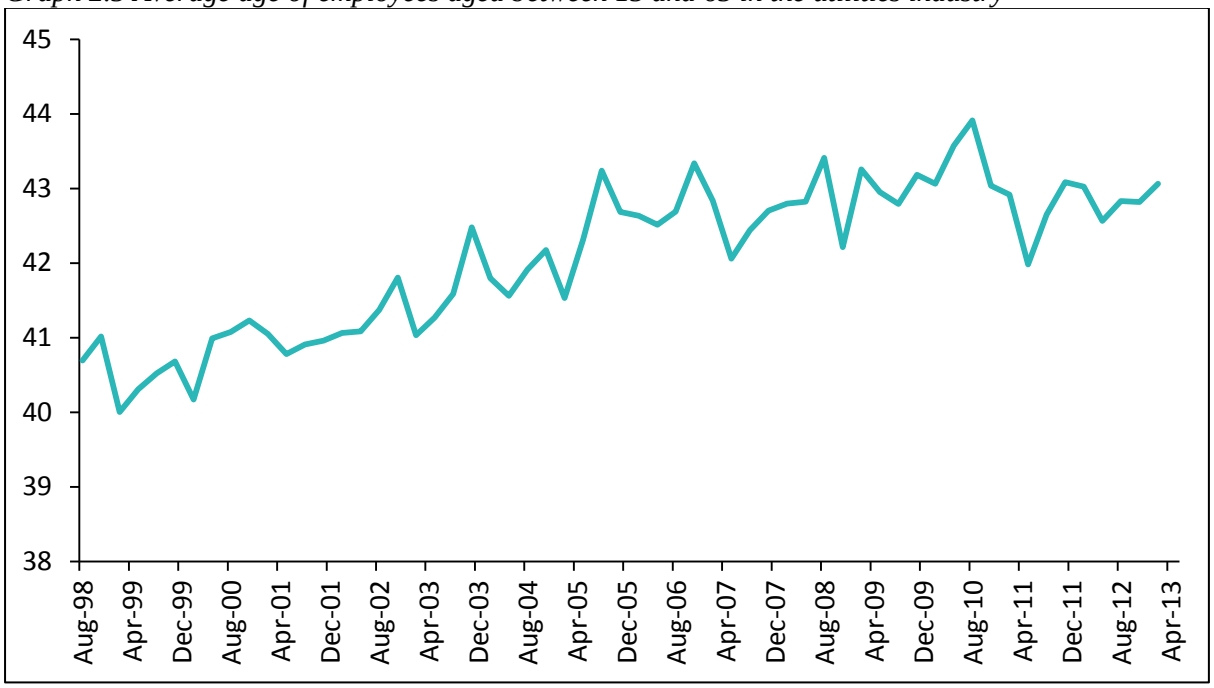
Table 2.2. Average weekly total cash earnings per employee, by occupation (May quarter 2012)

	Average weekly total cash earnings ($)
Managers	1926
Professionals	1438
Technicians and trades workers	1247
Community and personal service workers	707
Clerical and administrative workers	972
Sales workers	607
Machinery operators and drivers	1283
Labourers	779

Source: ABS

Graph 2.5 shows that, in line with the overall aging of the Australian population, the average age of the utilities workforce has increased since the late 1990s (employment of older employees has increased as a share of total employment). The most recent data suggest this trend may be reversing.

Graph 2.5 Average age of employees aged between 15 and 65 in the utilities industry



Source: ABS; Independent Economics.

* Average age of employees aged 15 – 65. The data that are used for Graph 2.5 are employment in the industry, spread across seven age brackets. To calculate the average age, Independent Economics has assumed each member of each age bracket has lived for the middle number of years in the bracket.

Similar to the changing occupation mix, the increase in the average age of employees in the utilities industry puts upward pressure on the level wages in the industry and the growth rate in AWE wages relative to WPI wages. This is because older employees tend to be more highly paid. The higher pay of older workers, in general, reflects their higher levels of productivity (which in turn reflects the fact they usually have more experience). Table 2.3, taken from Census data, shows that wages generally increase with the age of the worker.

Table 2.3. Average weekly personal income, by age bracket*

	Average weekly personal income ($)
10-19 years	143
20-29 years	653
30-39 years	822
40-49 years	812
50-59 years	765

Source: Australian Census 2011
* For individuals earning between $0 and $1999 per week

Changes in the composition of the workforce brings into question whether a fixed weight measure, such as the WPI or a variable weight measure such as the AWE should be used, particularly when the changes in the composition result from changes in the relative wage. Theoretically, an ideal wage measure would use weights that reflect the substitutability of the different types of labour in the labour bundle. A fixed weight measure is ideal when there is no substitutability between the different types of labour. When there is no substitutability business are not able to change the composition of the workforce in response to changes in relative wages (e.g. the relative wage of high skilled labour to low skilled labour), so fixed weights correctly reflect the impact of the relative wage change on the business' average labour cost. In contrast, a variable weight measure is ideal when the different types of labour in the labour bundle are perfectly substitutable.

In practice, different types of labour are neither perfectly substitutable nor have zero substitutes. Hence, neither the WPI nor AWE is ideal for measuring the impact of changes in relative wages. For example, for an increase in the relative wage of professionals to tradespersons, the WPI would overstate the cost to the business of this increase because it ignores the ability of the business to substitute away from professionals towards tradespersons and thus reduce the impact of the relative wage increase on its labour costs. On the other hand, the AWE does capture this substitution possibility but would understate the cost of the wage increase to the business. This is because, for example, a tradesperson would not be able to perform the work as well as a professional (e.g. the quality of the work may be lower) and this imposes a cost to the business.

2.3.3 Superannuation

The WPI and the AWE data do not include superannuation payments. This means when minimum employer superannuation payments are *increasing* as a share of wages, as they are set to do between 2012/13 and 2019/20, the WPI and the AWE may *underestimate growth* in labour costs. Thus, growth in WPI or AWE wages may need to be adjusted upwards if it is to be used to assess growth in total labour costs, given the forthcoming changes in superannuation requirements.

Hence, growth in labour costs may exceed growth in the WPI and the AWE for Distribution Network Service Providers (DNSPs) who are making minimum employer superannuation payments. However, for DNSPs making above minimum employer superannuation payments, this may not be the case.

2.4 Productivity-adjusted wage measure

As discussed earlier, the AER takes the outlook for growth in nominal wages and subtracts forecast growth in labour productivity and inflation, to generate forecasts of a real labour cost escalator. It is

important that the adjustments made to the original nominal wage series is consistent with the wage measure used. There is currently an inconsistency in the method used by the AER. Specifically, the WPI does not include the impact on wage growth from compositional effects or changes to hours worked, but the productivity adjustment applied by the AER would implicitly allow for this.

In section 2.2 it was shown that if hours per worker are increasing and the structure of the workforce has changed towards more educated and experienced employees, the WPI data *underestimates* growth in nominal wages per worker because it does not measure wages growth that flows from these trends. On the other hand, the labour productivity measure used by the AER and its consultant is based on a per worker measure and thus would include these effects. Output per worker grows as workers work more hours and as the average worker becomes more educated and experienced. This means that growth in the WPI less growth in output per worker *underestimates* growth in labour costs per worker. This means the AER has been underestimating the cost pressures faced by the utilities industry.

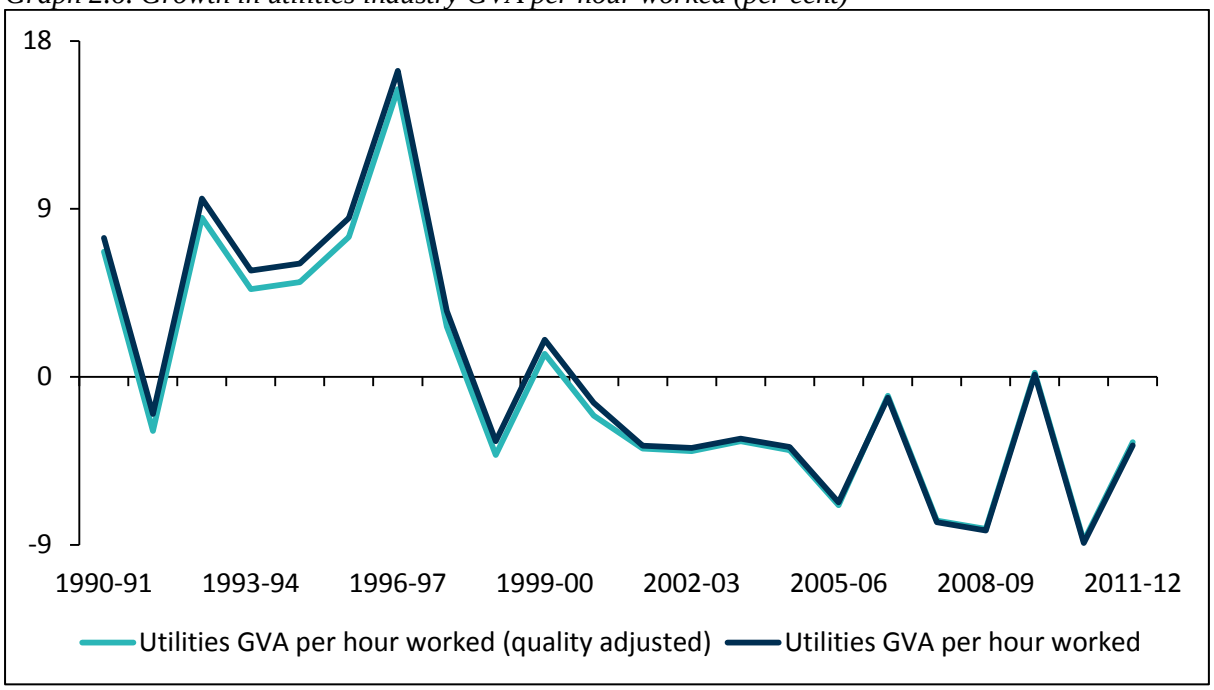
There are two ways to remove this inconsistency. Firstly, the AER could use a wage measure which is consistent with its labour productivity measure. The most appropriate labour cost measure from this perspective would be the COE, since it captures compositional effects and is the wage measure that is fully consistent with the National Accounts and thus fully consistent with output measures.

One drawback of this approach is that the COE per employee data exhibit a high level of volatility, particularly when disaggregated at the state or industry level. There are two sources of this volatility. Firstly, COE per worker is calculated using data from two different sources (COE is taken from the national accounts, where employment (workers) is taken form the labour force survey) and this adds to COE's volatility. Secondly, because the COE data are the most comprehensive labour income measure they are driven by many factors and this also adds to their volatility. However, if the COE data includes a driver that should be included in the labour cost escalator, and the other data do not, then the COE's additional volatility may be deemed acceptable.

Alternatively, an adjustment could be made to the labour productivity growth used by the AER. For example, an output per hour measure of productivity could be used and an adjustment could be made for productivity growth stemming from compositional effects.

Analysis by the AER's consultant suggests that composition-related productivity effects are small. In the utilities industry, data published by the ABS suggests that output per hour worked has grown only slightly more quickly than output per *quality adjusted* hour worked, as shown in Graph 2.6. For the quality adjustment, the ABS accounts for the level of education attainment and the experience of the workforce. Graph 2.6 suggests that the productivity boost (and wages growth) that is created by a better educated and older workforce in the utilities industry is small.

Graph 2.6. Growth in utilities industry GVA per hour worked (per cent)



Source: ABS; Independent Economics

However, labour productivity growth on a per hour measure compared with a per worker measure can vary. For example, since 1980-81 productivity growth on a GDP per-hour worked basis averaged 1.54 per cent per year, while on a GDP per worker basis it averaged 1.27 per cent per year. Similarly, since 2000-01, productivity growth has averaged 1.32 per cent and 0.88 per cent under the per-hour and per-worker measure, respectively. Faster productivity growth on a per hour measure is consistent with a fall in the number of hours worked per employee.

2.5 Conclusion

This section analyses the advantages and shortcomings of WPI wages and compares the WPI to other wage measures such as the AWE. The results from this analysis is summarised in table 2.1. As shown in the table, each wage measure has its own strengths and weaknesses. For example, the WPI is the least volatile but does not include any composition effects.

As discussed in section 2.3.2, no wage measure accurately captures composition effects because an ideal wage measure would use weights that reflect the substitutability of different types of labour used by the utilities business. The WPI, a fixed weighted index, would be a good proxy for wages when different types of labour have low substitutability. Conversely, the AWE, a variable weighted index, would be a good proxy for wages when there is a high level of substitutability. Ideally, the AER should choose the wage measure – AWE or WPI – that is most consistent with the methodology utilities businesses use to plan their labour requirements. This is because forecasts of wage growth should be combined with forecasts of growth in labour demand to develop forecasts of growth in the wage bill or total labour costs. If labour requirement planning is done on a per-hour basis, then WPI would be appropriate because it measures wage growth on a per-hour basis. Conversely, if labour requirement planning was done on a per worker basis, then the AWE would be more appropriate, since this is also measured on a per worker basis.

However, Ausgrid have informed Independent Economics that neither approach is feasible, and that utilities companies simply grow their labour costs at a rate consistent with the outlook for the labour cost escalator. This means we need to consider forecasts of both WPI and AWE, in order to form a judgement on labour cost pressures in the utilities industry. Forecasts of both measures are presented in this report.

Importantly, regardless of the measure used, a key determinant of the forecasts is the robustness of the model used to develop them and the underlying economic assumptions. Independent's approach to forecasting labour costs are discussed in the following section.

Finally, it is important that any productivity adjustment to the wage forecast is made consistently. That is, the productivity measure used should be comparable to the chosen wage measure. For example, growth in the WPI minus growth in output per worker will not correctly measure growth in unit costs because the WPI does not respond to changes in hours per worker or to changes in the composition of the workforce, but output per worker does. The key source of disconnect is hours per worker. If hours per worker are changing, WPI growth less productivity growth (where productivity growth is based on an output per worker measure) will be a poor estimate of the *true* growth in unit costs. On the other hand compositional effects are less material, consistent with the findings of other forecasters.

Notably, in its most recent determination (for Electranet in April 2013), the AER did not make an adjustment for productivity and noted this was because it could not calculate 'quality adjusted' labour productivity with an appropriate level of certainty.[4]

[4] AER, *Final decision, ElectraNet,Transmission Determination 2013-14 to 2017-18,* (pg 54).

3 Methodology

This report includes forecasts for both the WPI and the AWE in the utilities industry and the professional services industry in the relevant jurisdictions. This section describes the methodology that was used to generate these forecasts.

3.1 Forecasts for wages

The main tool used to develop the forecasts is the Independent Macro-econometric modelling system. At the core of this fully-integrated system is a state-of-the-art macro-econometric model that captures the broad workings of the Australian economy. A demographic model generates population scenarios for the core model, while a satellite state model takes the national level forecasts from the core model and develops them to the state level.

Importantly for this project, the labour market is modelled robustly, based both on economic principles and evidence from the historical data. The specific features of the labour market modelling incorporated in the Independent Macro-econometric model are as follows.

- **Labour supply**. In the long-term, labour supply is determined by the age and gender composition of the population. The model's population growth and population characteristics are driven by a demographic model, which incorporates assumptions regarding fertility, longevity, interstate and overseas migration. The model accounts for all types of immigration, including temporary workers (such as those on 457 visas). In the short term, labour supply is also determined by labour demand, this is known as the 'encouraged worker' effect.

- **Labour demand**. In a Keynesian short run, employment is demand determined in each industry. However, as prices gradually adjust, a representative firm in each industry determines the amount of labour it wishes to employ based on wages, and the amount of other factors of production (capital and natural resources) that is available. That is, the level of employment in each industry is based on profit maximisation by firms.

- **Labour market clearing**. Wages adjust to clear the labour market. That is, wages adjust so that the unemployment rate is at its sustainable level. For example, as labour market conditions tighten, that is when unemployment is above its sustainable rate, wages are bid up. This would tend to reduce labour demand and gradually bring the unemployment rate back to its sustainable level. The sustainable rate of unemployment is estimated based on a long-term analysis of the historical unemployment rate. Importantly, this analysis allows for the fact that there have been structural changes in the Australian labour market which has affected the sustainable level of the unemployment rate.

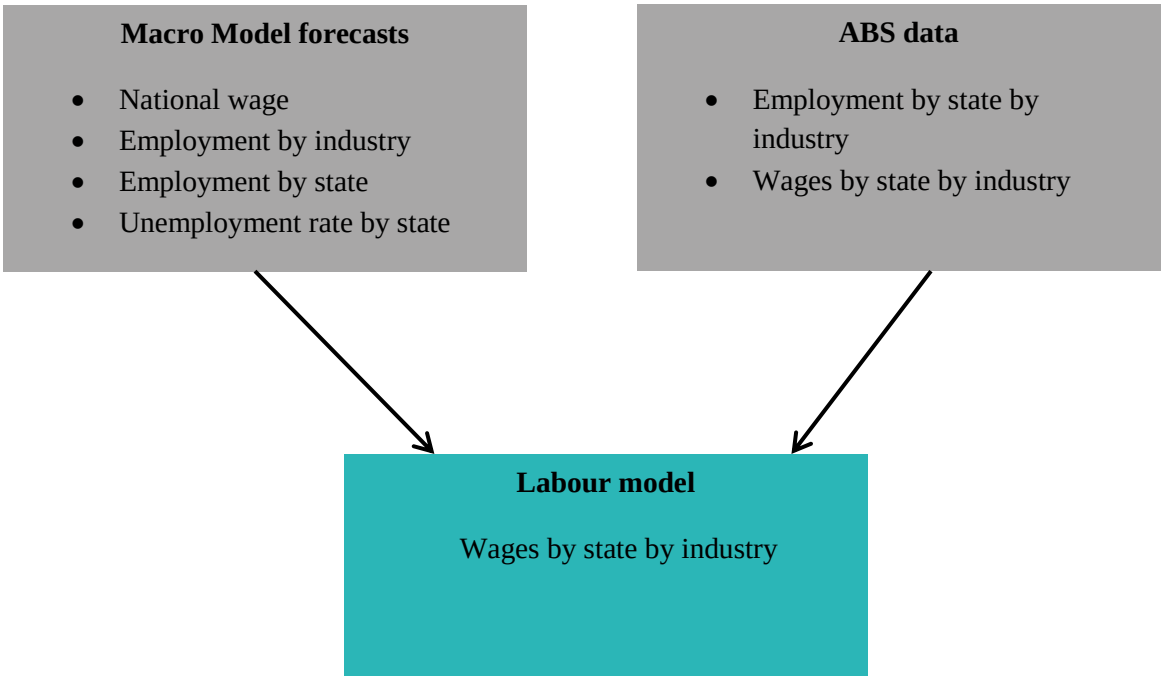
A satellite states model ensures that all state level forecasts are fully consistent with the national forecast. Importantly, the state forecasts allow for the differences in a state's industry composition. For example, Western Australia and Queensland are exposed to the mining sector, while New South Wales is exposed to the financial sector. This means, for example, that strong mining exports are likely to benefit Western Australia and Queensland more than other states, and have a greater impact on their activity.

Independent's forecasts for wage growth each industry is also fully consistent with the national forecast. For example, industry-level wages are forecast to grow *relative* to economy-wide wages; this is determined by the outlook for labour demand in each industry *relative* to economy-wide labour demand. Labour demand in each industry is driven by activity in the industry in the short term. This means, for example, that the depreciation of the Australian dollar would encourage activity in the manufacturing sector as they become more internationally competitive. This would support solid wage growth in manufacturing.

Independent's forecasts for wage growth in each industry at the state level are also fully consistent with the national outlook. This is because they are generated from our forecasts of wages by industry and wages by state using a widely accepted technique called the residual allocation system[5].

The forecasting approach is illustrated in Figure 3.1

Figure 3.1. Generation of labour market forecasts in the Independent Macro-econometric model



3.2 Data collection

The data used in the Independent Macro-econometric model and new labour cost model to forecast wages by state by industry have been obtained from the ABS. The data are a combination of publically available data and data available by special request. The data used for this project are listed in Table 3.1.

[5] This technique is also used by the ABS. For example, they use it to produce input-output tables.

Table 3.1. List of key ABS data used in the forecast and analysis

ABS data series	Catalogue Number	Latest included data
National accounts (quarterly)	5206.0	December quarter 2013
National accounts (annual)	5220.0	2011-12 financial year
Labour force (monthly)	6202.0	April 2013
Labour force (quarterly)	6291.0.55.003	March quarter 2013
Wage price index (quarterly)	6345.0	March quarter 2013
Average weekly earnings (semi-annual)*	6302.0	November 2012
Average weekly cash earnings (bi-annual)**	6306.0	November 2012

Source: ABS
* Until May 2012, average weekly earnings data were released quarterly. Independent Economics has constructed a quarterly history for Average Weekly Earnings using interpolation to fill in August 2012.
** Average weekly cash earnings (which provide data on earnings by occupation) are released every two years in the Employee Earnings and Hours Survey (cat. 6306.0)

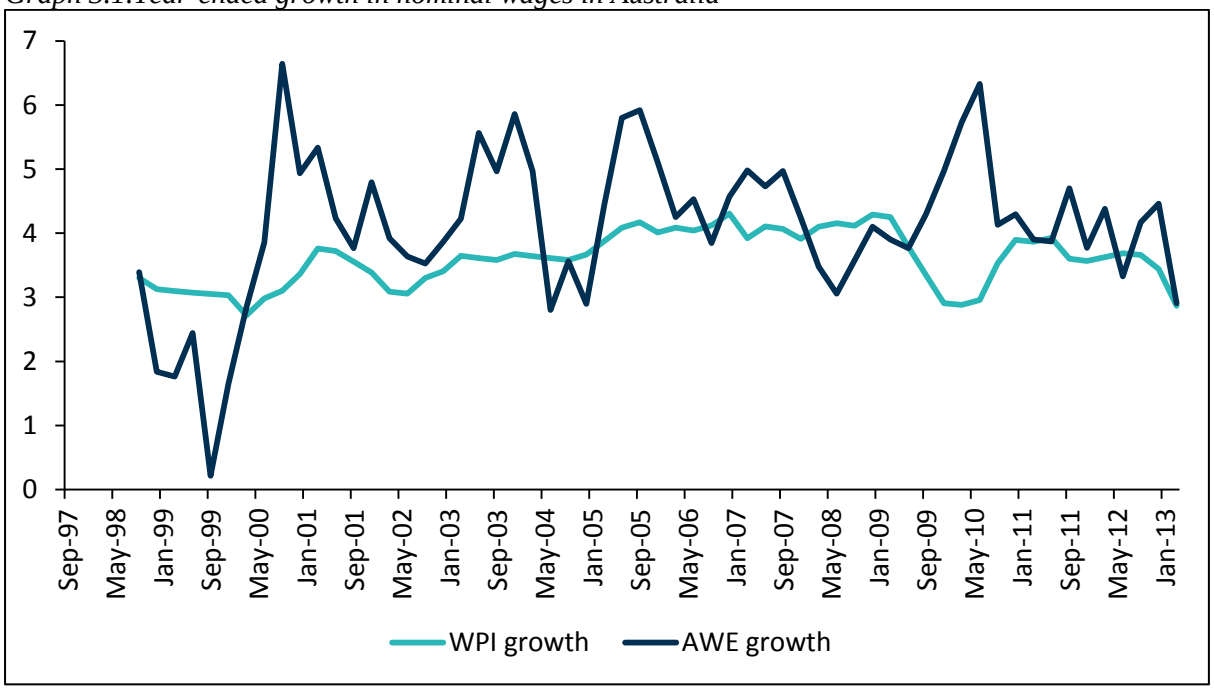
3.3 AWE forecasts

Both the forecasts for AWE and WPI are derived from their relationship with the COE-based wage measure that is contained in the Independent Macro-econometric model. As both are forecast relative the same variable, these forecasts are explained relative to each other. This section discusses the AWE forecasts *relative* to the WPI forecasts.

As described in section 2, in the short term, the outlook for the WPI is driven by the state of the labour market. In the longer term, it is expected to grow in line with inflation and labour productivity growth. As outlined in the following section, labour market conditions are expected to improve so and WPI wage growth is expected to accelerate. In all industries and states, the forecast for growth in AWE wages is weak relative to growth in WPI wages in the near-term and then stronger at the end of the forecast horizon.

Prior to the GFC, AWE wages grew more quickly than WPI wages. This is shown in Graph 3.1. A shift towards higher paying jobs offset the effect of a trend decrease in hours worked per employee, such that AWE growth was quicker than WPI growth.

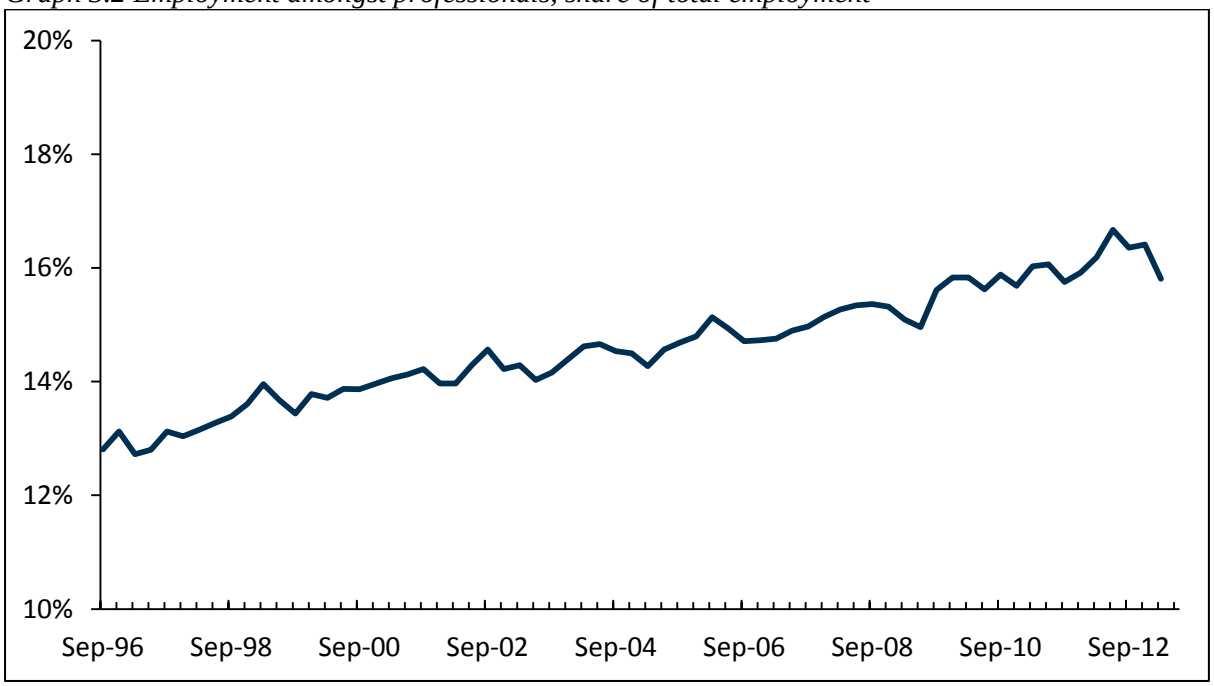
Graph 3.1.Year-ended growth in nominal wages in Australia



Source: ABS; Independent Economics

As the population became more educated, the share of the workforce holding higher paying jobs increased. For example, employment amongst professionals as a share of the workforce increased, as shown in Graph 3.2. This increased growth in AWE wages relative to WPI wages.

Graph 3.2 Employment amongst professionals, share of total employment



Source: ABS; Independent Economics

Between the mid-1990s and mid-2000s, hours worked per employee fell (as shown in Graph 3.3). This trend most likely reflects the aging of the population because as employees get closer to retirement, they tend to scale back the hours they work. It has probably been supported – over time – by an increase in workplace flexibility, which makes it easier for people to work part-time if they

wish. Further, the pre-GFC period saw strong gains in household wealth, which may have allowed some people to work fewer hours.

Graph 3.3. Hours per worker

Source: ABS

Immediately after the GFC period, AWE wages growth was particularly strong relative to WPI wages growth. While WPI wages growth eased, AWE wages growth accelerated sharply. One potential reason for this is that employers were reluctant to take on new staff, given the economic uncertainty, and any increases in labour requirements were met by increasing the hours worked by existing staff. (This logic is not clear-cut however as employers could increase labour inputs – in an uncertain environment – by taking on more part-time workers. If most of the existing workers at companies where this is occurs work full-time, increasing the number the part-time workers will tend to reduce hours per worker). Another driver may be because employment amongst professionals continued to grow relatively strongly.

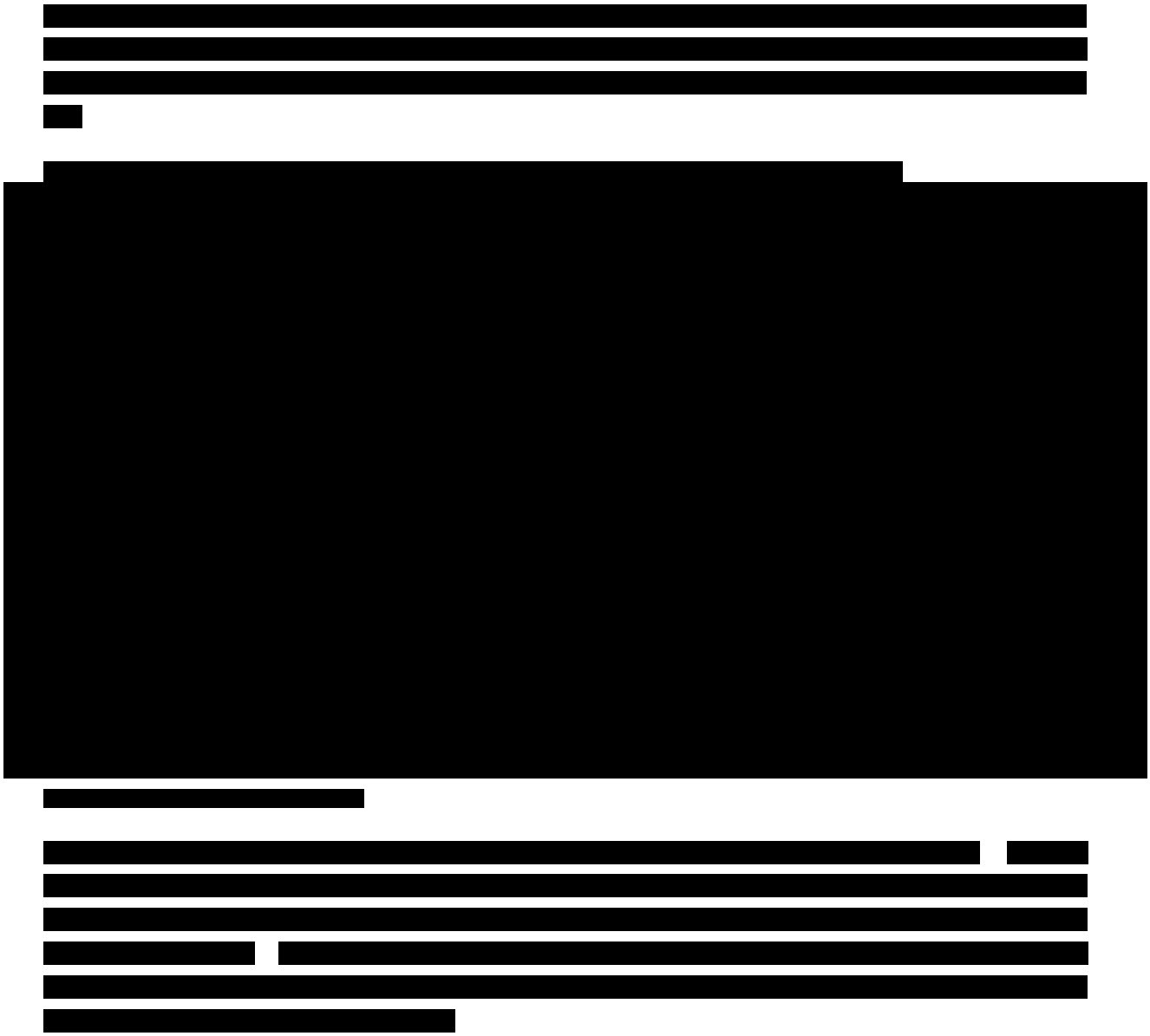
This trend is expected to unwind, and for hours per employee to drop back to a level that is consistent with its trend decline. In this period, AWE wages growth will be weak relative to WPI growth. There are already signs that hours per worker are falling back in some industries – for example, hours per worker fell in the utilities industry over 2012 - perhaps prompted by the soft patch Australia experienced in 2012. Therefore, hours are expected to drop in the short-term, and for AWE wage growth to be weak relative to WPI growth at the start of the forecast period. This point is elaborated in section 4.

4 The outlook for the economy and the labour market

As described in Section 3, the forecast for wage growth in the industries, states and the industries in the states have been generated with the Independent Macro-econometric model and new wages model. A key driver for these forecasts is the outlook for the Australian economy. This section describes the current outlook for the Australian economy and wages growth, including wages growth in the relevant state and industries. For ease of exposition, and to reflect the modelling approach of Independent Economics, this commentary focuses on why these state and industry outlooks differ from the outlook for Australia.

4.1 Economic outlook for Australia

4.1.1 Economic conditions



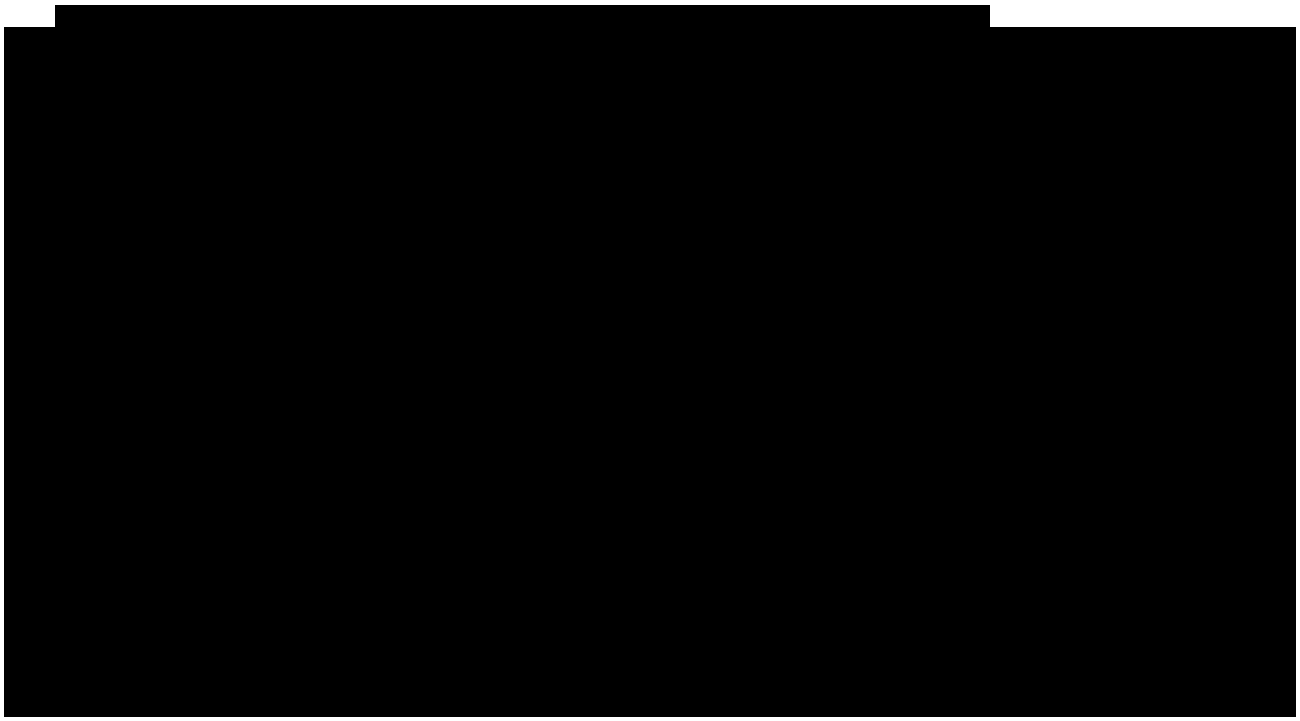


Table 4.1. Economic history and economic projections, growth rates, Australia

	Real GDP growth	Employment growth	Unemployment rate	CPI inflation
History				
2000-01	1.9	2.0	6.5	6.0
2001-02	3.9	1.3	6.7	2.9
2002-03	3.2	2.6	6.2	3.0
2003-04	4.1	1.6	5.6	2.4
2004-05	3.2	2.7	5.2	2.4
2005-06	3.0	3.1	4.9	3.2
2006-07	3.8	2.9	4.5	3.0
2007-08	3.8	3.1	4.3	3.4
2008-09	1.6	1.8	4.9	3.1
2009-10	2.1	1.0	5.5	2.3
2010-11	2.4	2.6	5.1	3.1
2011-12	3.4	1.1	5.3	2.3
2012-13	2.7	1.2	5.3	2.3
Forecasts				
[redacted]				

Source: ABS; Independent Economics

4.1.2 The Australian labour market and employment growth

[redacted]

4.1.3 WPI wages growth

[redacted]

[redacted]

[redacted]

[redacted]

4.1.4 AWE wages growth

[redacted]

[redacted]

[redacted]

Table 4.2. Growth in nominal wages in Australia – WPI wages vs. AWE wages

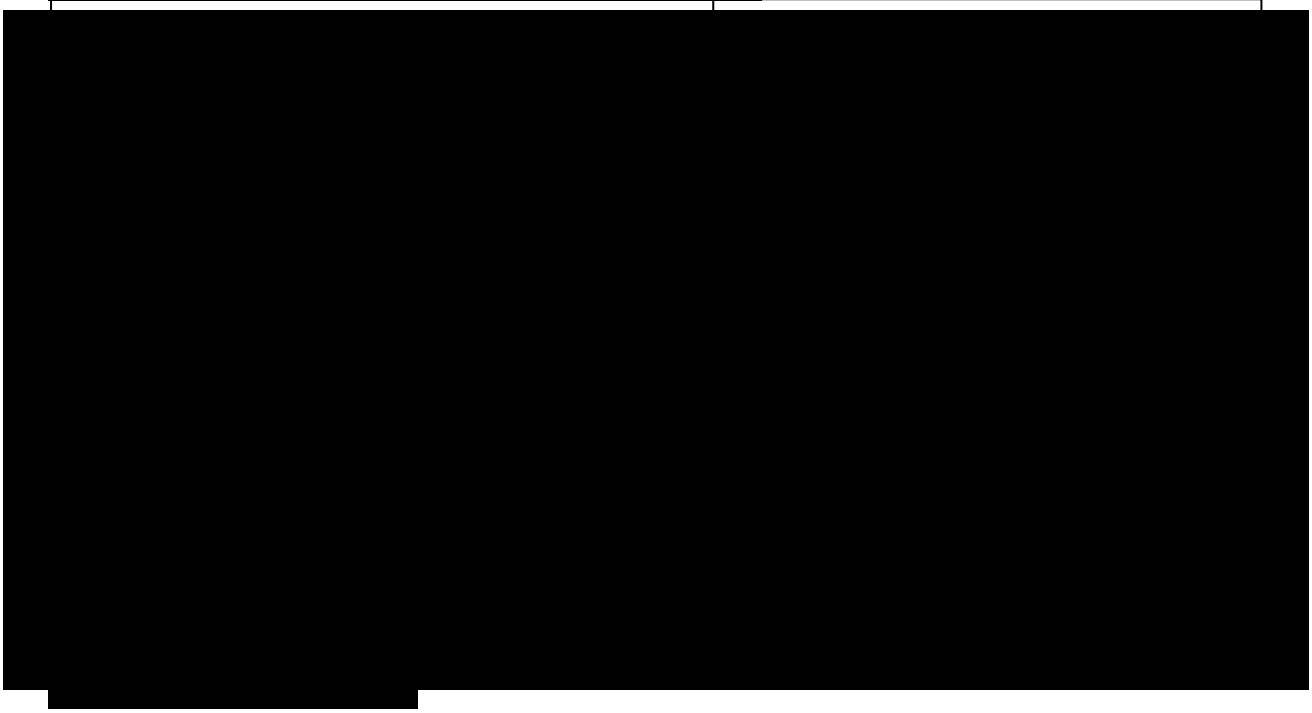
	WPI Wages	AWE Wages
2007-08	4.1	3.9
2008-09	4.1	3.8
2009-10	3.0	5.3
2010-11	3.8	4.0
2011-12	3.6	4.0
2012-13	3.1	3.7
[redacted]	[redacted]	[redacted]

Source: ABS; Independent Economics

4.2 Economic outlook for New South Wales

4.2.1 Economic conditions

[redacted]



[redacted]

4.2.2 NSW labour market and employment growth

Employment growth in New South Wales is expected to remain below the national average (shown in [redacted]

[redacted]

[redacted]

4.2.3 WPI wages growth in NSW

Table 4.3. WPI wages growth in Australia and selected states

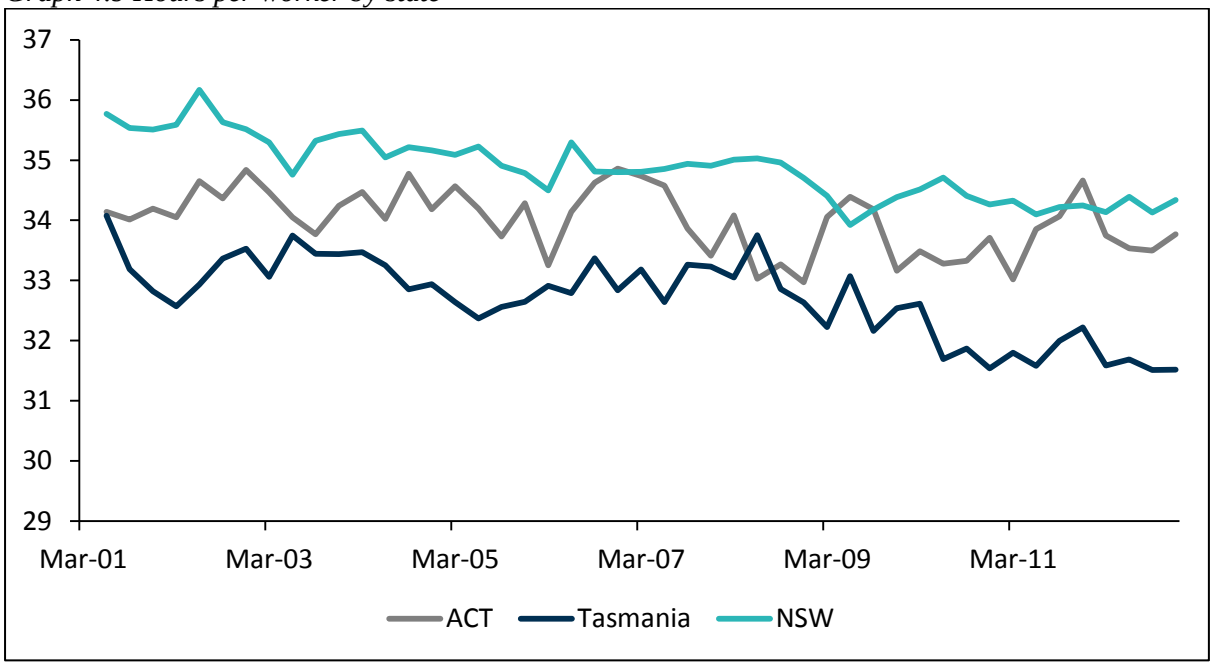
	WPI wages				AWE wages			
	Australia	NSW	Tasmania	ACT	Australia	NSW	Tasmania	ACT
2008-09	4.1	3.9	4.4	4.0	3.8	1.0	0.6	6.5
2009-10	3.0	3.0	3.7	3.3	5.3	4.0	7.1	6.8
2010-11	3.8	3.8	3.4	3.6	4.0	3.3	6.5	7.1
2011-12	3.6	3.6	3.5	3.3	4.0	2.9	5.2	5.7
2012-13	3.1	3.0	2.9	3.8	3.7	3.9	4.4	5.1

Source: ABS; Independent Economics

4.2.4 AWE wages growth in NSW

[redacted]

Graph 4.9 Hours per worker by state



Source: ABS; Independent Economics

[redacted]

Graph. 4.10. Employment of professionals, share of total employment

Source: Independent Economics

4.3 Economic outlook for Tasmania

4.3.1 Current economic conditions and outlook

[redacted]

[redacted]

[redacted]

4.3.2 Labour market conditions and employment growth in Tasmania

[redacted]

4.3.3 WPI wages growth in Tasmania

[redacted]

4.3.4 AWE wages growth in Tasmania

[redacted]

[redacted]

4.4.2 Labour market and employment in the ACT

[redacted]

4.4.3 WPI wages growth in the ACT

[redacted]

4.4.4 AWE wages growth in the ACT

[redacted]

4.5 The outlook for selected industries at the national level

4.5.1 Utilities industry

[redacted]

[redacted]

Table 4.4. Employment by occupation in Australia and selected industries (per cent of total)

	Australia	Utilities	Professional services
Managers	13	12	11
Professionals	22	21	56
Technicians and trades workers	15	24	10
Community and personal service workers	10	0	0
Clerical and administrative workers	15	21	19
Sales workers	9	3	2
Machinery operators and drivers	7	13	0
Labourers	10	7	1

Source: ABS (Labour force survey, data are average for 2012 calendar year)

4.5.2 Professional services

[redacted]

Table 4.5. Growth in nominal wages in Australia and selected industries

	WPI Wages			AWE Wages		
	Australia	Utilities	Professional Services	Australia	Utilities	Professional Services
2007-08	4.1	4.0	4.3	3.9	2.4	7.6
2008-09	4.1	4.5	5.3	3.8	5.2	5.7
2009-10	3.0	4.3	2.9	5.3	8.9	5.8
2010-11	3.8	4.1	4.4	4.0	10.7	5.1
2011-12	3.6	3.5	4.4	4.0	2.6	2.5
2012-13 (e)	3.1	4.0	3.5	3.7	4.9	2.3
[redacted]						

Source: ABS; Independent Economics

4.5.3 AWE wages in the utilities and professional services industries

[redacted]

[redacted]

5 Detailed forecasts for wages

Section 4 presented forecasts for economic activity, employment and WPI wages growth in Australia and the relevant states and industries. This section presents forecasts of WPI and AWE wages for the relevant industries, *in* the relevant states. These forecasts use the outlook for the labour markets in each state to explain how the wage outlook in a state's industry differs from the wage outlook for that industry at the national level.

5.1 The utilities industry

[redacted]

Table 5.1. Growth in nominal wages in the utilities industry

	Utilities Industry - WPI wages				Utilities Industry - AWE wages			
	Australia	NSW	Tasmania	ACT	Australia	NSW	Tasmania	ACT
2009-10	4.3	3.8	4.9	4.3	8.9	7.5	10.7	10.1
2010-11	4.1	3.5	3.8	4.0	10.7	9.5	12.8	13.3
2011-12	3.5	3.2	3.5	3.4	2.6	1.9	4.2	4.8
2012-13 (e)	4.0	3.7	3.9	4.7	4.9	5.2	5.8	6.7
[redacted]								

[redacted]

5.2 The professional services industry

[redacted]

[redacted]

Table 5.2 Growth in nominal wages in the Professional Services Industry

	Professional Services - WPI wages				Professional Services - AWE wages			
	Australia	NSW	Tasmania	ACT	Australia	NSW	Tasmania	ACT
2009-10	2.9	4.3	3.5	3.3	5.8	4.6	7.7	7.1
2010-11	4.4	3.6	4.0	3.6	5.1	4.0	7.1	7.6
2011-12	4.4	3.7	4.4	3.3	2.5	1.9	4.2	4.8
2012-13 (e)	3.5	3.5	3.4	3.8	2.3	2.6	3.2	4.0
[redacted]								

Source: ABS;

[redacted]

6 Wages growth in electricity distribution

Under the ABS industry classification, ANZSIC 2006, the utilities industry is made up of the Electricity, Gas, Water and Waste sub-industries. The Electricity industry itself is made up of several components, including generation, transmission, distribution, retail and electricity market operations. Ausgrid is an electricity distribution business.

Historically, the AER has applied the AWE or WPI for the utilities industry for all its determinations, regardless of whether the business is primarily providing one particular component of the electricity supply chain e.g. distribution. This section analyses whether it wage growth in the utilities industry is a reasonable proxy for wage growth in electricity distribution.

6.1 WPI wages

As noted in section 2, the WPI measures the weighted average change in the labour costs associated with performing the set of tasks that are required to generate output in an industry or economy.

Wages growth in the electricity distribution and electricity transmission sub-industries will not necessarily be well measured by the WPI for the utilities industry. The nature of the output in these industries is different which means their output is generated by different 'tasks' and they employ individuals with different occupations.

Table 6.1 shows that wages growth in these three industries would be different if the wages of technicians and trade workers, professionals, machinery operators and drivers and labourers were growing at different rates. Electricity distribution employs more technicians and trade workers, electricity transmission employs more professionals and utilities employs more machinery operators and drivers and labourers.

Table 6.1. Employment by occupation in Utilities, electricity distribution and electricity transmission

	Electricity distribution	Electricity transmission	Utilities**
Managers	9%	14%	12%
Professionals	18%	46%	19%
Technicians and trades workers	44%	24%	26%
Community and personal service workers	0%	0%	0%
Clerical and administrative workers	23%	17%	19%
Sales workers	1%	0%	2%
Machinery operators and drivers	1%	0%	14%
Labourers	4%	0%	8%

Source: ABS (special request data for 2010/11 financial year
** Utilities is Electricity, Gas, Waste and Water Industry

Despite these differences it appears that the WPI wages in utilities provides a reasonable proxy for WPI wages growth in the electricity distribution and electricity transmission sub-industries.

- [redacted]

- [redacted]

*Table 6.2. Average Weekly Cash Earnings by Occupation**

	May-06	May-12	Per cent change
Managers	1489	1926	4.4
Professionals	1125	1438	4.2
Technicians and trades workers	948	1247	4.7
Community and personal service workers	574	707	3.5
Clerical and administrative workers	735	972	4.8
Sales workers	484	607	3.8
Machinery operators and drivers	948	1283	5.2
Labourers	598	779	4.5
Average per cent change, weighted by occupation distribution of…			
Electricity distribution	--	--	4.6
Electricity transmission	--	--	4.4
Utilities	--	--	4.6

Source: ABS; Independent Economics

* The ABS collects data for average weekly cash earnings from a sample that is different to average weekly earnings. Also, the series differ conceptually. Average weekly cash earnings includes salary sacrifices, whereas average weekly earnings does not. AWCE data are published once every two years. May-06 data was chosen as a comparison as the next data in the history were published in Aug-08, and thus influence by the GFC.

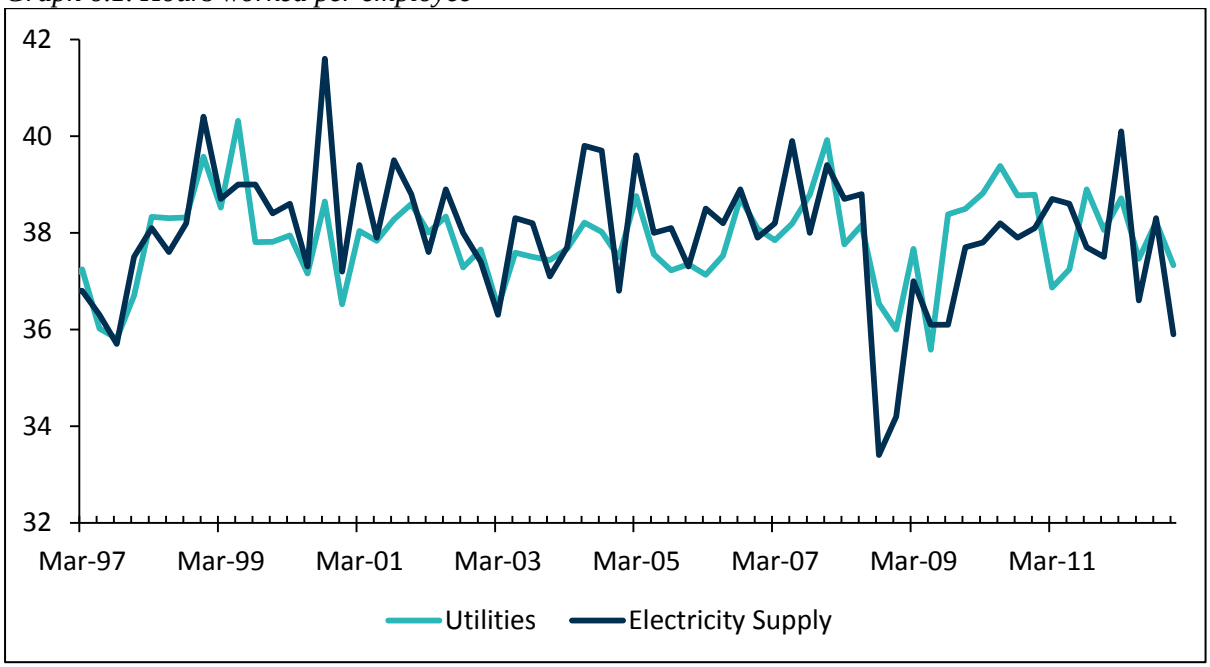
6.2 AWE wages

It is not possible to definitively determine whether AWE wages in the utilities industry are good measure of AWE wages in the electricity distribution and electricity transmission industries, as Independent Economics is unable to approximate growth in AWE wages in the electricity distribution and electricity transmission industries. This is because a history of employee earnings by occupation that includes observations with similar dates to the data for employment by occupation in these industries is not available. However, an indicative analysis shows that AWE wages in utilities is a

reasonable proxy of AWE wages in electricity distribution and electricity transmission. This analysis is outlined in this section.

As explained, one of the most important drivers of differences between AWE wages growth and WPI wages growth is changes in hours worked per worker. Graph 6.1 shows that hours per worker in the electricity supply sub-industry follows a similar pattern to hours per worker in the utilities industry.

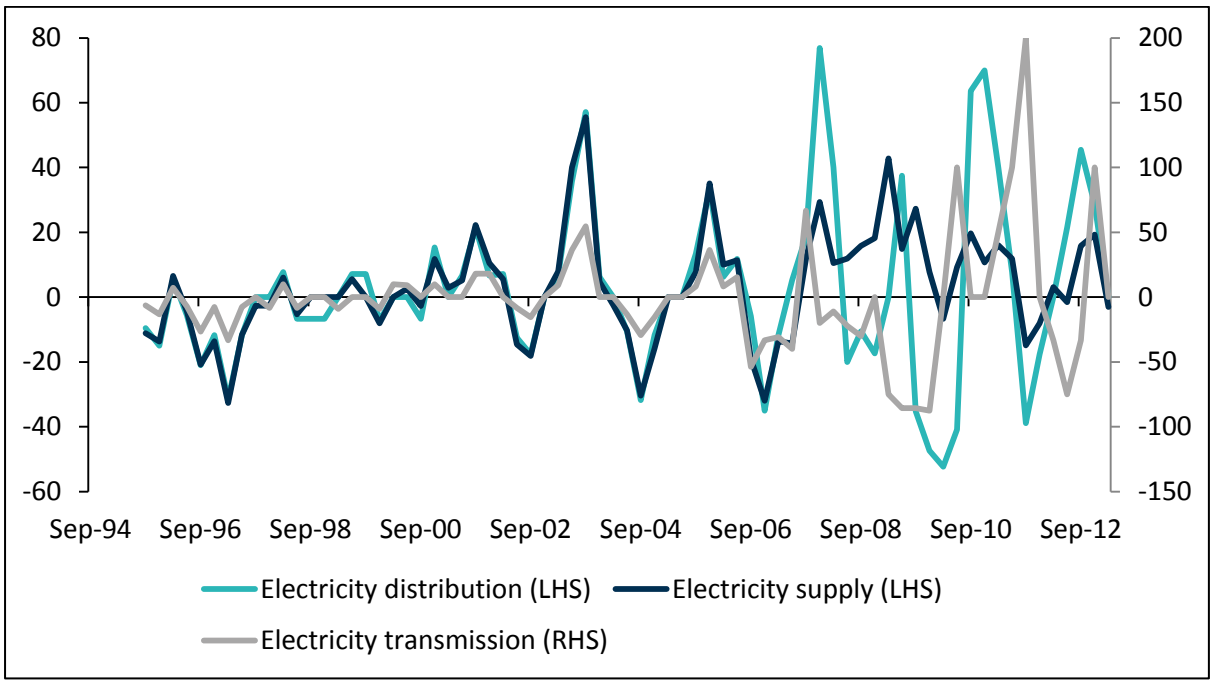
Graph 6.1. Hours worked per employee



Source: ABS; Independent Economics

Further, Graph 6.2 shows that employment growth in the electricity distribution and electricity transmission industries follow patterns that are broadly similar to the pattern of employment growth in the electricity supply industry. If employment conditions follow similar patterns, this suggests that hours per worker follow similar patterns in these three industries. In turn, this means hours per worker in these industries follow a similar pattern to hours per worker in utilities.

Graph 6.2 Year-ended employment growth, per cent



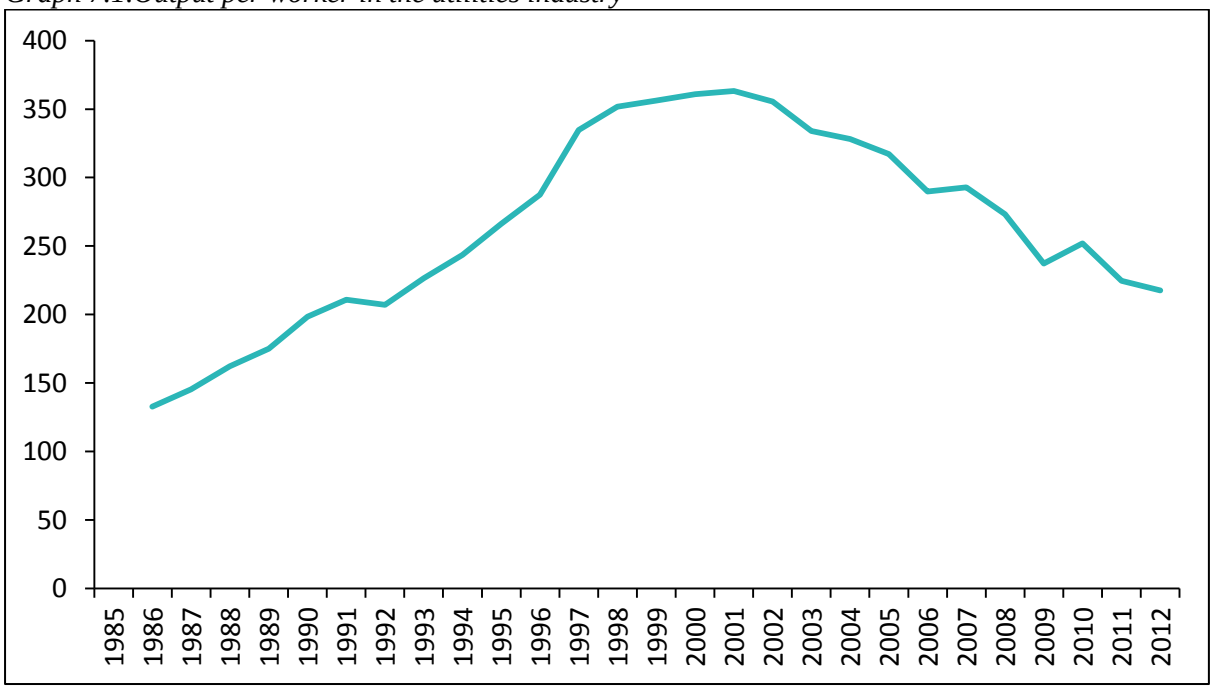
Source: ABS; Independent Economics

Thus, since WPI wages in utilities is a reasonable measure of WPI wages in electricity distribution and electricity transmission, and hours per worker follow a similar pattern in these industries, this implies that AWE wages in utilities is a good measure of AWE wages in electricity distribution and electricity transmission.

7 The productivity performance of the utilities industry

In terms of productivity performance, the utilities industry has gone through two distinct phases. From the middle of the 1980s to around 2001, labour productivity in terms of output per worker grew by around 7 per cent year, as shown in Graph 7.1. Then, from 2001 to 2012, output per worker fell by 4.5 per cent per year. Throughout this period, output grew at a reasonably steady pace (shown in Graph 7.2, below).

Graph 7.1.Output per worker in the utilities industry



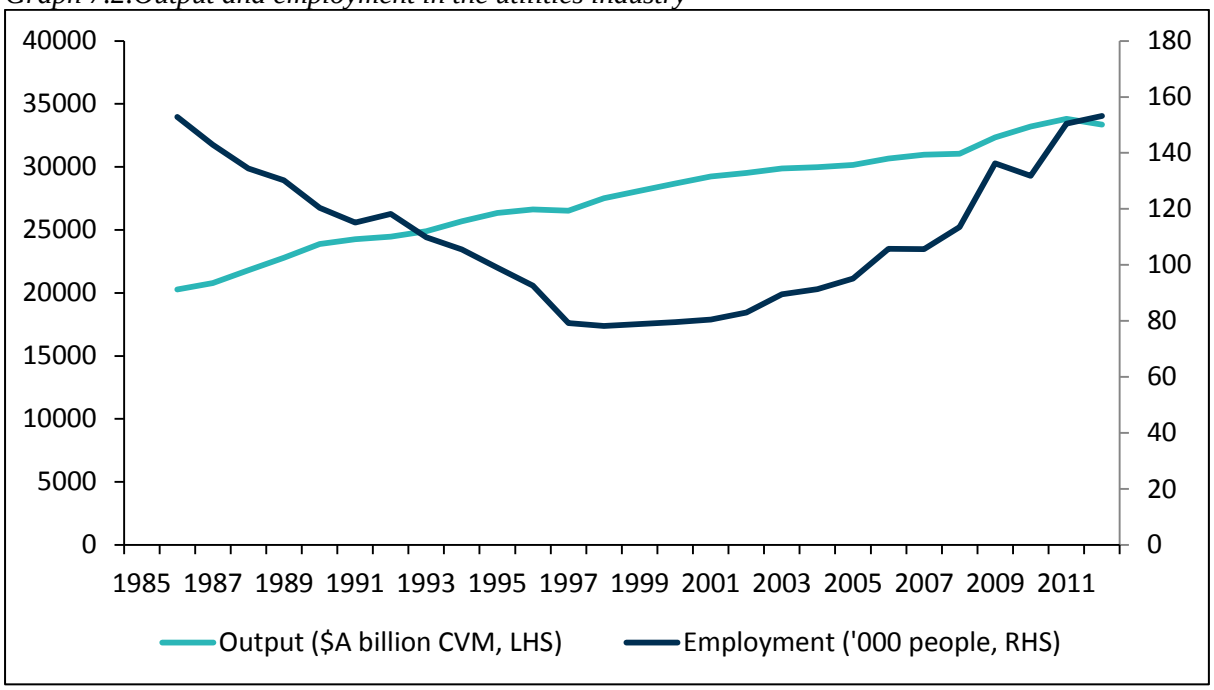
Source: ABS; Independent Economics

Section 7 explains these trends, and assesses the outlook for output per worker. A relevant consideration here is the capital stock and its use. The AER's treatment of productivity growth is also discussed.

7.1 Output per worker in the utilities industry

Between the middle of the 1980s and the end of the 1990s, employment fell sharply in utilities, as shown in Graph 7.2. The utilities sector was reformed during this period and these reforms allowed (and forced) the industry to use labour more efficiently. For example, one reform that was applied to the sector during this period was an increase in the competition between companies that operated in the sector. This increased competition saw the industry shedding workers heavily. Annual average growth rates in output per worker are provided in Appendix D.

Graph 7.2.Output and employment in the utilities industry



Source: ABS; Independent Economics

Since the early 2000s, employment has recovered quite quickly, but this has not translated into higher output. According to Topp and Kulys (2012) employment has expanded as more workers have been required to help upgrade and augment network infrastructure. As this work does not constitute extra output their employment has weighed on output per worker. The authors also note that some workers have been employed to learn the skills of older workers who are set to retire. The marginal output created by these new workers (while their older colleagues remain employed) is likely to be small, which means their employment has potentially weighed on output per worker.

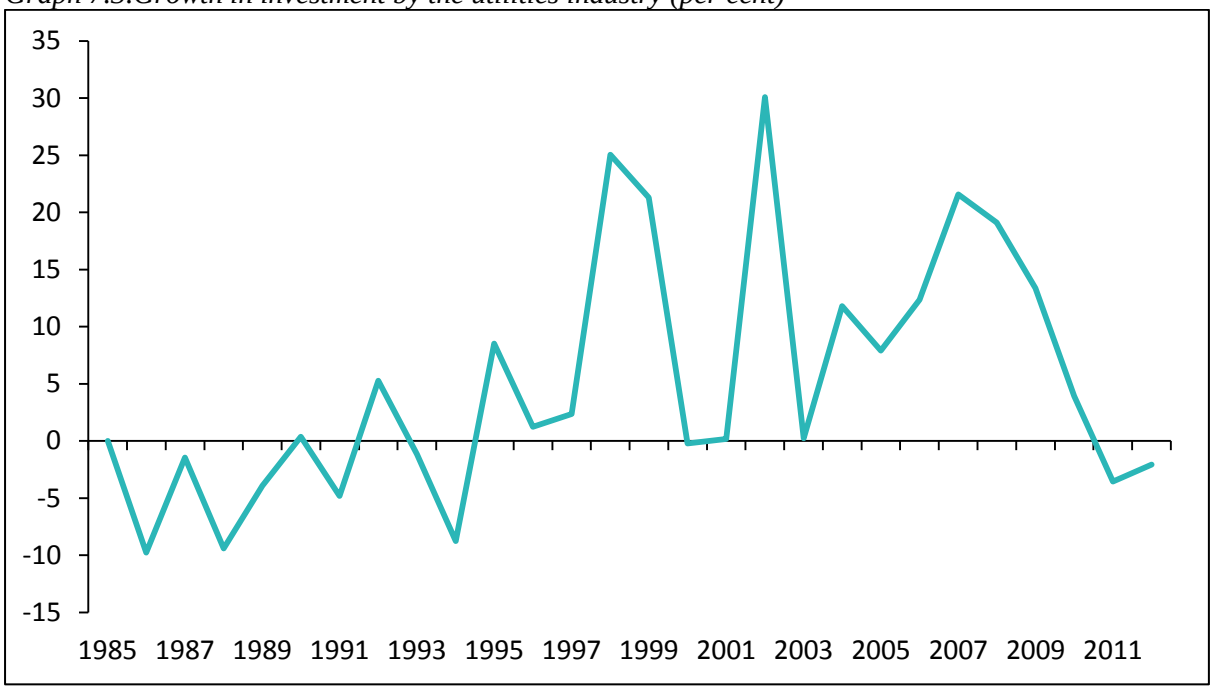
Hiring workers to upgrade and augment infrastructure has reflected the investment boom that has been underway in the utilities industry since the late 1990s (Graph 7.3 shows investment in utilities has grown strongly on average since then) This investment boom, so far, has not translated into strong output growth for three reasons according to the Productivity Commission.

- The utilisation of new production facilities that have been created in this investment boom has been low. Some new assets have built to service 'peak demand' in summer (which has increased sharply relatively to normal demand due to an increase in the use of air-conditioning). Production at these assets drops sharply outside' peak' periods. Other new production assets have designed with future demand in mind. Production at these assets should rise as the economy grows in the in the long-term. In relation to the these assets, the Commission notes that investment in utilities tends to 'lumpy' or 'cyclical' with periods of rapid investment following periods of slow investment.

- Some new investment has gone into improving output 'quality' but not output 'quantity'. For example, investments in underground cabling and upgrades to assets to improve the reliability of supply do not result in increases in measured output.

- Some new investment has been directed towards reducing the environmental impact of production in the sector, rather than expanding production. Notably, some investment has focused on shifting away from brown coal fired production.

Graph 7.3.Growth in investment by the utilities industry (per cent)



Source: ABS; Independent Economics

It is likely that labour productivity growth will improve in the future, because the factors driving its recent poor productivity performance are either cyclical or temporary. Firstly, output in the utilities industry will continue to grow as demand for energy in the Australian economy expands. However, in the short term, weakness in the Australian economy is expected to lead to subdued demand for output from the utilities industry.

Secondly, employment growth is expected to slow. As noted, the recent in investment in the utilities is 'cyclical', which means the associated demand for labour is 'cyclical' as well. Investment in the utilities industry tends to 'cycle' between phases of substantial investment, where the new capacity that is required to meet demand for a number of years is built up, and phases of weaker investment. This means investment is expected to weaken; indeed, investment growth has already slowed in recent years. With this, the labour demand in the industry that is attributable to this investment can be expected to slow. Further, once the skills transfer from the older workers to the younger workers in the utilities industry is complete, it is likely that when older workers retire, they will not be replaced by new workers. (In effect, this replacement is happening now before their retirement).

Overall, employment growth can be expected to weaken while output growth will remain solid and thus growth in output per worker can be expected to improve. Independent Economics expects that productivity in the utilities industry will slowly recover over the forecast period to a long term trend of 1.5 per cent per annum.

References

Australian Energy Regulator (April 2012), *Powerlink – final decision – April 2012*

Australian Energy Regulator (April 2013), *Final Decision for ElectraNet's2013-18 regulatory control period*

Deloitte Access Economics (February 2013), ElectraNet Determination 2013-18

Department of Innovation (2010), Employment Outlook for Professional, Scientific and Technical Services

Topp and Kulys (April 2012), *Productivity in Electricity, Gas and Water: Measurement and Interpretation* (Productivity Commission, Staff Working Paper)

Appendix A: Calendar year forecasts

Table A.1. Calendar Year Forecasts for Australia and Australian Industries

	WPI Wages			AWE Wages		
	Australia	Utilities	Professional Services	Australia	Utilities	Professional Services
2008	4.2	4.2	5.0	3.6	3.2	6.4
2009	3.6	4.4	4.2	4.2	5.8	4.7
2010	3.3	4.6	3.5	5.1	12.3	7.3
2011	3.7	3.6	4.4	4.1	6.4	2.2
2012	3.6	4.0	4.2	4.1	2.2	3.6
2013	2.8	3.5	3.0	2.5	5.1	1.7
[redacted]						

Source: ABS; Independent Economics

Table A.2. Calendar Year Forecasts for NSW and NSW Industries

	WPI Wages			AWE Wages		
	NSW	NSW - Utilities	NSW - Professional Services	NSW	NSW - Utilities	NSW - Professional Services
2012	3.5	3.9	3.6	3.8	1.9	3.3
2013	2.6	3.2	3.1	2.2	5.0	1.6
[redacted]						

Source: ABS; Independent Economics

Table A.3. Calendar Year Forecasts for TAS and TAS Industries

	WPI Wages			AWE Wages		
	TAS	TAS - Utilities	TAS - Professional Services	TAS	TAS - Utilities	TAS - Professional Services
2012	3.3	3.8	4.0	5.1	3.4	4.9
2013	2.6	3.4	2.9	2.1	4.8	1.4
[redacted]						

Source: ABS; Independent Economics

Table A.3. Calendar Year Forecasts for ACT and ACT Industries

	WPI Wages			AWE Wages		
	ACT	ACT - Utilities	ACT - Professional Services	ACT	ACT - Utilities	ACT - Professional Services
2012	4.0	4.6	4.7	6.7	5.1	6.6
2013	3.2	3.8	3.3	2.2	5.2	1.8
[redacted]						

Source: ABS; Independent Economics

Appendix B: Productivity

Table B.1. Percentage change in real output per number of people employed in utilities industry

	Utilities industry
Financial year ended	Growth in output per worker (per cent)
1987	10
1988	12
1989	8
1990	13
1991	6
1992	-2
1993	9
1994	8
1995	9
1996	8
1997	16
1998	5
1999	1
2000	1
2001	1
2002	-2
2003	-6
2004	-2
2005	-3
2006	-9
2007	1
2008	-7
2009	-13
2010	6
2011	-11
2012	-3

Source: ABS; Independent Economics